

## SALIENT FEATURES

**TYPE OF SCHEME** : Cascade to Mistri Khola HEP with augmented flow from Ghatte Khola

### LOCATION

Rural Municipality : Annapurna (Former: Narchyan and Shikha VDC)

District : Myagdi

Zone : Dhaulagiri

Province No : 4

Project Area : Latitude 28° 29' 00" N to 28° 30' 21" N

: Longitude 83° 38' 51" E to 83° 39' 47" E

Access to Project : 100 km from Pokhara

### HYDROLOGY

Catchment Area of Mistri Khola HEP at Intake : 298.8 km<sup>2</sup>

Catchment Area of Ghatte Khola at Intake : 7.10 km<sup>2</sup>

CA of Mistri Khola HEP at PH : 3946.3 km<sup>2</sup>

CA of Mistri Khola 2 HEP at PH : 3966.5 km<sup>2</sup>

Design Discharge of Mistri Khola HEP : 18.23 m<sup>3</sup>/s

Design Discharge of Ghatte Khola : 0.47 m<sup>3</sup>/s

Design Discharge to Turbines of Mistri Khola 2 HEP : 18.70 m<sup>3</sup>/s

Compensation Discharge at MKHEP Intake : 0.35 m<sup>3</sup>/s

### FLOOD

I in 100 years Flood at Balancing Pond Area : 1,611 m<sup>3</sup>/s

I in 100 years Flood at Powerhouse Area : 1,625 m<sup>3</sup>/s

### GHATTE KHOLA DIVERSION

### HEADWORKS

#### i. WEIR

Type : Free Flow Concrete Weir

Length : 5.50 m

Height : 1.0 m above natural river bed

Weir Crest Elevation : 1303 masl

## ii. UNDERSLUICE

No. of Opening : 1  
Size of Opening : 1.0 \* 1.0 (B \* H)  
Invert Level : 1301.67 masl

## iii. INTAKE

Type : Side Intake  
No. of Orifice : One  
Size of Orifice : 1.2 m \* 0.8 m (B \* H)  
Orifice Invert Level : 1301.95 masl

## iv. GRAVEL TRAP

Size : 2.0 m \* 1.4 m (L \* B)  
Bed Slope : 1 in 40

## v. APPROACH CANAL

Shape : Rectangular Size  
: 0.8 m \* 1.0 m (B \* H) (Including FB)  
Length : 26.0 m  
Bed Slope : 1 in 120

## vi. SETTLING BASIN

No. of Bays : 2  
Size of Uniform Section (Each Bay) : 15.0 m \* 2.5 m \* 1.4 m (L \* B \* H)  
Design Particle Size : 0.15 mm  
Settling Basin Trap Efficiency : 90%  
Flow Velocity in the Basin : 0.2 m/s  
Bed Slope : 1 in 40  
Flushing Pipe : 11.0 m x 0.3mØ

## vii. CONNECTING PIPE

Material : Steel

|                   |   |       |
|-------------------|---|-------|
| Internal Diameter | : | 0.5 m |
| Length            | : | 48 m  |

### viii. CASCADE SPILL CANAL

|                     |   |       |
|---------------------|---|-------|
| No of Drops         | : | 5     |
| Length of Each Drop | : | 5.0 m |
| Drop Height         | : | 2.2 m |

## MAIN WATERWAYS

### i. BALANCING POND

|                             |   |                                      |
|-----------------------------|---|--------------------------------------|
| Normal Water Level at Start | : | 1257.75 masl                         |
| Length                      | : | 11.0 m (Including transition)        |
| Uniform Section Size        | : | 6.0 m * 4.0 m (B * H) (Including FB) |

### ii. HEADRACE CULVERT

|        |   |                                      |
|--------|---|--------------------------------------|
| Type   | : | Rectangular, Buried                  |
| Length | : | 396.0 m                              |
| Size   | : | 3.5 m * 2.5 m (B * H) (Including FB) |
| Slope  | : | 1 in 1000                            |

### iii. FOREBAY

|                           |   |                            |
|---------------------------|---|----------------------------|
| Length of Uniform Section | : | 16.56 m                    |
| Width of Uniform Section  | : | 9.0 m                      |
| Depth of Pond             | : | Varying from 6.2 to 13.3 m |
| Min. Submergence Required | : | 5.0 m                      |
| Normal Water Level        | : | 1256.81 masl               |

### iv. HEADRACE PIPE

|                   |   |         |
|-------------------|---|---------|
| Material          | : | Steel   |
| Length            | : | 262.5 m |
| Internal Diameter | : | 2.85 m  |

### v. HEADRACE TUNNEL

|                 |   |                        |
|-----------------|---|------------------------|
| Section Type    | : | Inverted-D             |
| Excavation Size | : | 4.0 m * 4.20 m (B * H) |

Length : 2223.0 m

#### vi. SURGE SHAFT

Diameter : 6.0 m finished

Height : 36.0 m

Maximum Upsurge Level : 1269.43 masl

Minimum Downsurge Level : 1245.38 masl

#### vii. PENSTOCK

Material : Mild Steel of 250 Grade

Internal Diameter : 2.25m (Before Branching)

: 1.60m (After Branching)

Thickness : 14 - 25 mm

Length : 109.5 m (Before Branching)

: 36.3 m each (After Branching)

#### POWERHOUSE

Type : Surface

Dimension : 22.75m (L) x 11.30m (W) x 23m (H)

Control Building (H) : 22.75m (L) x 5.60m (W) x 16.5m

#### TAILRACE

Normal Water Level : 1178.50 masl

Minimum Water Level : 1177.20 masl

Type : Rectangular, Covered

Length : 16.0 m

Size : 4.0 m (B) x 2.5 m (H) (Including FB)

#### TURBINES

Type of Turbine : Francis (Vertical Axis)

No. of Units : Two

Turbine Axis Level : 1176.5 masl

Unit Discharge : 9.35 m<sup>3</sup>/s

Rated Efficiency : 93.0%

**GENERATOR**

|                    |   |                          |
|--------------------|---|--------------------------|
| Type               | : | Silent Pole, Synchronous |
| Generation Voltage | : | 11 kV                    |
| Frequency          | : | 50 Hz                    |
| Efficiency         | : | 97.5%                    |

**TRANSFORMER**

|                |   |                      |
|----------------|---|----------------------|
| Type           | : | Three-Phase, Step-up |
| Rated Capacity | : | 14 MVA               |
| Voltage Ratio  | : | 11/132 kV            |
| Efficiency     | : | 99%                  |

**TRANSMISSION LINE**

|                |   |                      |
|----------------|---|----------------------|
| Voltage Level  | : | 132 kV               |
| Length         | : | 3.0 km               |
| Conductor Type | : | ACSR "BEAR"          |
| From           | : | Switchyard of MK2HEP |
| To             | : | Switchyard of MKHEP  |

**ENERGY GENERATION**

|                    |   |           |
|--------------------|---|-----------|
| Gross Head         | : | 79.25 m   |
| Rated Net Head     | : | 72.79 m   |
| Mean Annual Energy | : | 69.38 GWh |
| Dry Season Energy  | : | 21.27 GWh |
| Wet Season Energy  | : | 48.11 GWh |

**PROJECT COST ESTIMATE**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Total Cost of Project | : | 1,847 million NRs. (Before IDC) |
|-----------------------|---|---------------------------------|

|                            |   |         |
|----------------------------|---|---------|
| <b>CONSTRUCTION PERIOD</b> | : | 3 years |
|----------------------------|---|---------|